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EOLITHIC AND PALEOLITHIC MAN

By GEORGE GRANT MacCURDY

The last two years have witnessed important developments in the domain of prehistoric anthropology. This is particularly true of the European field and of discoveries in which skeletal remains of early man have figured. One such was discussed by me recently in this journal,[1] viz., that of *Homo Mousteriensis.* Two others form the subject of the present paper. The first of these was made by Dr Otto Schœtensack[2] on October 21, 1907, in a sand-pit near the village of Mauer, ten kilometers southeast of Heidelberg. Mauer lies in the valley of the Elsenz, a tributary of the Necker. The human lower jaw was found in situ in the so-called Mauer sands, at a depth of 24.10 meters and .87 meter from the bottom of the deposit. The first 10.92 meters at the top of the section are composed of loess which is classed as upper Quaternary, while the Mauer sands forming the rest of the section are lower Quaternary. The loess itself represents two district periods, an older and a younger.

The horizon from which the human lower jaw came has furnished other mammalian remains, including *Felis spelæa*, *Felis catus*, Canis, *Ursus arvernensis*, *Sus scrofa* var. *priscus*, *Cervus latifrons*, Bison, *Castor fiber*, Equus, *Rhinoceros etruscus*, and *Elephas antiquus.*

Schœtensack likens the fossil mammalian fauna of the Mauer sands to the preglacial Forest beds of Norfolk and the upper Pliocene of southern Europe. This is particularly true of *Rhinoceros etruscus*, and the horse of Mauer which is a transition form between *Equus Stenonis Cocchi* and the horse of Taubach, both of which may be referred definitely to the Pliocene. The rest of the mammalian fauna belongs to the lower Quaternary.

The coëxistence of man with *Elephas antiquus* at Taubach, near

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[1] Some Recent Paleolithic Discoveries, *American Anthropologist*, Oct.-Dec., 1908.

[2] *Der Unterkiefer des Homo Heidelbergensis aus den Sanden von Mauer bei Heidelberg: Ein Beitrag zur Paläontologie des Menschen*, von Otto Schœtensack. Mit 13 Tafeln, davon 10 in Lichtdruck. Leipzig: Verlag von Wilhelm Engelmann, 1908.

Weimar, gave Schœtensack special reasons for expecting to find human remains also at Mauer. The possibility of such a discovery had kept him in close touch for twenty years with the owner of the sand-pit, Herr J. Rösch. The discovery was made by one of the workmen, with whom at the time were another workman and a boy. Schœtensack was immediately informed, and arrived the following day. The lower jaw was intact, but the stroke of the workman's shovel had caused the two halves to separate along the line of symphysis. It was discolored, and marked by incrustations of sand exactly as are all fossil bones from the Mauer sands. A limestone pebble was so firmly cemented to the left half of the jaw, covering the premolars and first two molars, that the crowns of all four stuck to the pebble when the latter was removed. Both the jaw and the pebble were marked by dendritic formations.

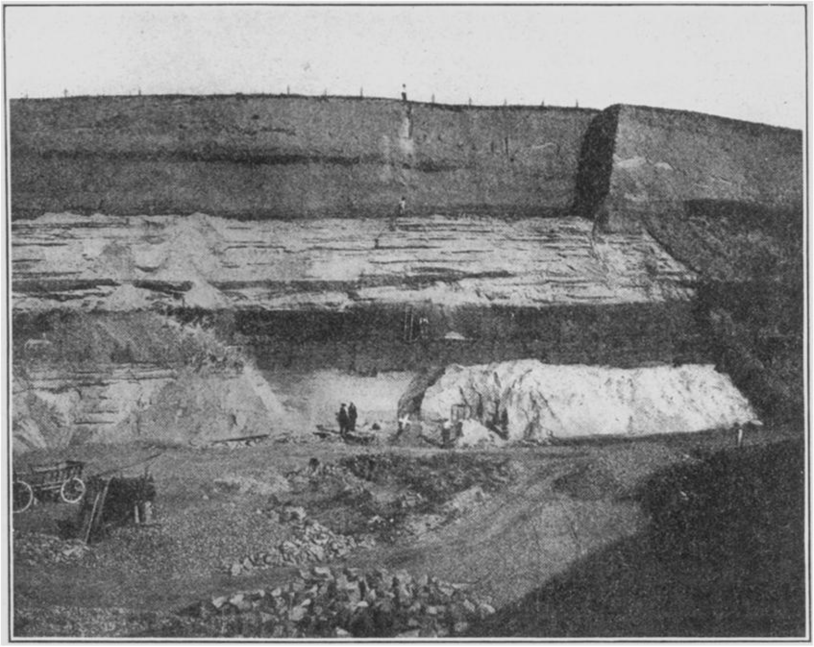

FIG. 12. — Sand-pit at Mauer. The lower jaw was found at the spot marked with a cross.

Perhaps the first thing to attract one's attention is the absence of a chin. The region of the symphysis is somewhat gorilloid, while the ascending ramus suggests rather the gibbon. The teeth, however, have a distinctly human stamp, not only in their general appearance, but also in point of size — larger than the average, but smaller than in exceptional cases to be found among the Australians, for instance. One is impressed, in fact, by the relative smallness of the teeth as compared with the jaw in case of *Homo Heidelbergensis*. The alveolar arch is long enough, for example, to allow space for a fourth molar. I noted the same phenomenon in a collection of recent crania from Gazelle peninsula, New Britain.[1] In one of these the alveolar arch of the upper jaw projects 12 mm. beyond the third molar, while the average for the males is 8.6 mm. Respecting the series of lower jaws, I quote from my paper read in 1902: "The third molar is generally situated well in front of the ascending ramus of the lower jaw, when the jaw is so held as to bring the anterior margins of the rami in a line with the eye. With the jaw held in this position, the entire crown of the third molar can be seen in thirteen out of a total of eighteen cases."

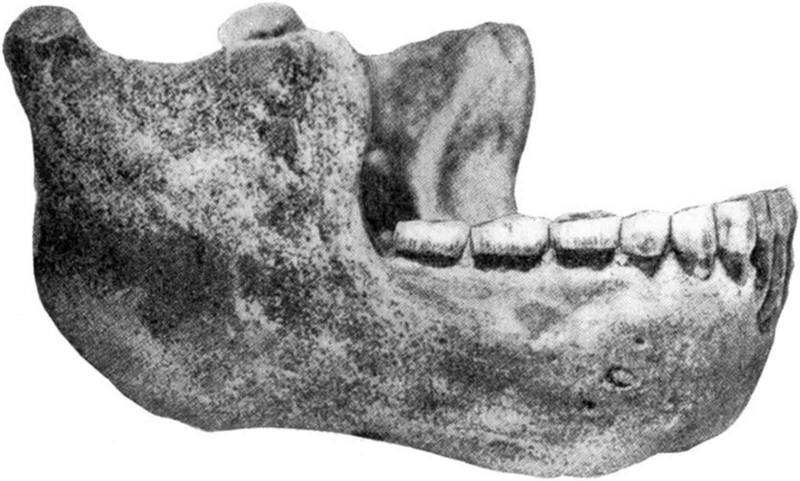

FIG. 13. — The lower jaw of *Homo Heidelbergensis*.

The crowns of the teeth in the Mauer specimen are worn enough to show the dentine, proof that the individual had reached the adult stage. All the molars, except the third left, have five cusps. The tendency in recent man is toward a four-cusp type for the third molar, if indeed there be a third molar. The breaking away of the crowns of four teeth on the left side tended to facilitate

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[1] *American Anthropologist*, 1902, N. S., IV, 474.

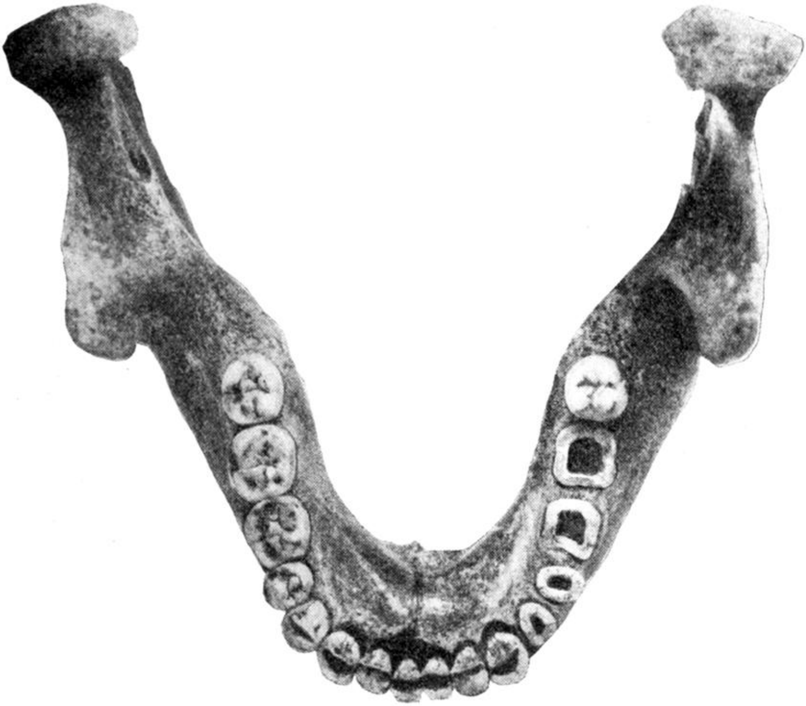

FIG. 14. — The lower jaw of *Homo Heidelbergensis* (about ¾).

the study of the pulp cavity and walls. This study reveals the fact that the dentition of *Homo Heidelbergensis* represents a youthful stage in the dentition of the modern European. That is to say, in the ontogeny of the latter, a stage representing adult dental characters when the race was young is now reached at the age of from nine to fourteen years. This is not an anthropoid character, but a primitive human character — another reason for leaving the anthropoids to one side in our search for the ancestral form and the origin of genus *Homo*.

A study of the corpus and ramus mandibulæ reveals at once a number of points of divergence from the modern European. The body is massive, and relatively long in proportion to the bicondylar breadth, its greatest height being in the region of the first and second molars. The basis mandibulæ, if applied to a plane, touches only on either side of the symphysis and near the angulus, forming three gentle arches — one medium and short, called by Klaatsch incisura submentalis; and two lateral and long, to which might be given the name incisura basilaris. The latter is seen to good advantage also in the chimpanzee.

The ramus is characterized by unusual breadth, 60 mm. as opposed to an average of 37 for recent examples. The angle formed by lines tangent to the basis and the posterior border of the ramus is 107° — smaller than the average. The processus coronoideus is exceedingly blunt, and the incisura mandibulæ correspondingly shallow. The condyloid process is noteworthy on account of the extent of articular surface, due to an increased antero-posterior diameter (13 and 16 mm.), since the transverse diameter is relatively short. The neck constriction is very slight, approaching in this respect the anthropoid forms.

The first fossil lower jaw to attract world-wide attention on account of its primitive characters and association with remains of the mammoth and rhinoceros, was that found in 1866 by Dupont in the cavern of La Naulette, valley of the Lesse, Belgium. It was only a fragment, but enough remained to demonstrate the complete absence of chin and the nature of the dentition. Its kinship with the man of Neanderthal, whose lower jaw could not be found, was evident. It tended therefore to legitimatize the latter, which hitherto had failed of general recognition. The fortunate association of skull with lower jaw came in 1886, when the remains of two individuals were discovered in the cavern of Spy, also in Belgium. In the same layer were found not only remains of the mammoth and the rhinoceros, but also an industry of the Mousterian type.

Among the human remains found in 1899 by Professor Gorjanovič-Kramberger at Krapina, there are parts of a number of lower jaws that bear the same racial characters as those of La Naulette and Spy. They were also associated with a Mousterian industry. Instead, however, of the *Rhinoceros tichorhinus*, as at Spy, there were remains of *Rhinoceros Merckii*, an older type. This may be accounted for by the fact that *Rhinoceros Merckii* would persist longer in the south than in the north.

That the lower jaws of La Naulette, Spy, and Krapina represent one and the same stage in the evolution of *Homo sapiens,* there is no longer any doubt. That this stage is intermediate between recent man and *Homo Heidelbergensis*, a careful comparison of the specimens in question furnishes ample proof. The lower jaw from Mauer is therefore pre-Neanderthaloid. That it also exhibits pre-anthropoid characters gives it a fundamental position in the line of human evolution.

Dr Schœtensack is to be congratulated on his rich reward for a twenty years' vigil. Let us hope that his reward for the search after human industry in the same deposits may be speedy and ample.

The lower jaws of the Neanderthal, or so-called primigenius, type, mentioned above, were all found in cavern or rock-shelter deposits. These cannot be definitely correlated with river-drift and loess; hence we cannot measure the time that separates the man of Spy from *Homo Heidelbergensis.* Judging from somatic characters alone, the time separating the two must have been considerable.

The Mousterian industry which is found associated with *Homo primigenius* occurs in deposits that mark the close of the middle Quaternary, and also in cavern deposits corresponding to the base of the upper Quaternary. It belongs to the transition from the Riss glacial period to the Riss-Würm interglacial period. At Wildkirchli, in the Alps, it is frankly interglacial, a station that probably belongs to the close of the Mousterian epoch.

The position of the Mauer lower jaw near the bottom of the old diluvium, and its association with the remains of *Elephas antiquus* and *Rhinoceros etruscus,* suggest for it a place at least as far back as the lower Quaternary. But the industry of the lower Quaternary is eolithic, the evolution of the Chellean type not taking place until the middle Quaternary. The probabilities are, therefore, that if Schœtensack finds any artifacts in the horizon of *Homo Heidelbergensis*, they will be of the eolithic type. Such a discovery would establish not only the identity of the maker of Quaternary eoliths, but would also help immensely to solve the riddle of Tertiary eoliths (Boncelles, Cantal, Chalk Plateau, etc.).

The most recent discovery of paleolithic human remains was made on August 3, 1908, by the Abbés J. and A. Bouyssonie and L. Bardon, assisted by Paul Bouyssonie, a younger brother of the first two. It is in many respects one of the most satisfactory, particularly on account of the pieces being so nearly complete. The locality is the village of La Chapelle-aux-Saints, twenty-two kilometers south of Brive, in the department of Corrèze, which forms a part of one of France's celebrated cavern belts, including Dordogne and Charente to the west.

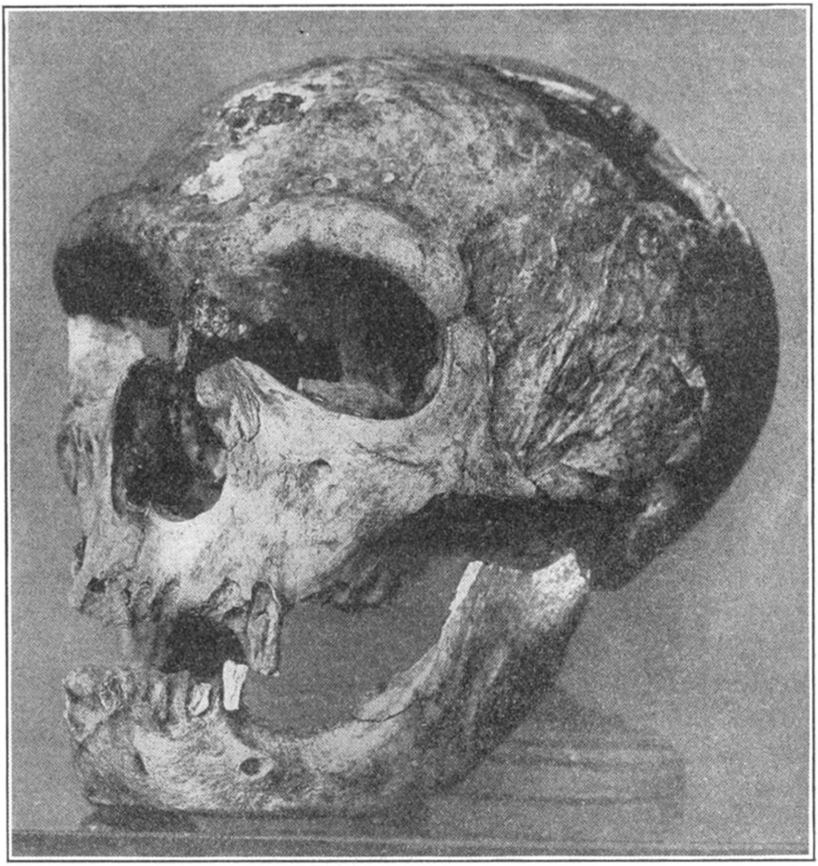

FIG. 15. — Skull of Mousterian age from the cavern of La Chapelle-aux-Saints (Corrèze), France.

It was only a few months earlier, and in this same belt, cavern of Le Moustier, valley of the Vézère, that Herr O. Hauser found *Homo Mousteriensis.* The discovery at La Chapelle-aux-Saints was also made in a cavern a short distance from the entrance. It includes not only human bones, but also stone implements and the remains of the reindeer, Bison (or Bos), Equus, *Capra ibex*, *Rhinoceros tichorhinus*, etc.

That this may have been a burial is suggested by the disposition of the human remains which seemed to lie in a rectangular pit sunk to a depth of thirty centimeters in the floor of the cavern. They were covered by a deposit intact thirty to forty centimeters thick, consisting of a magma of bone, of stone implements and of clay. The stone implements belong to a pure Mousterian industry. While some pieces suggest a vague survival of the Acheulian implement, others presage the coming of the Aurignacian. Directly over the human skull were the foot-bones, still in connection, of a large bovine animal — proof that the piece had been placed there with the flesh on, and proof, too, that the deposit had not been disturbed. Two hearths were noted also, and the fact that there were no implements of bone, the industry differing in this respect from that at La Quina and Petit-Puymoyen (Charente), as well as at Wildkirchli, Switzerland.

The human bones include the cranium and lower jaw (broken, but the pieces nearly all present and easily replaced in exact position), a few vertebræ and long-bones. The ensemble denotes an individual of the male sex, whose height was about 1.60 meters. The condition of the sutures and of the jaws prove the skull to be that of an old man. The cranium is dolichocephalic, with an index of 75. It is said to be flatter in the frontal and occipital regions than those of Neanderthal and Spy.

Beyond the loss of teeth, due evidently to old age, the skull is so nearly intact as to make possible the application of the usual craniometric procedure, thus leading to a more exact comparative study than has been possible, for example, in all previously discovered paleolithic human skulls dating from the same period, not excepting even Spy and *Homo Mousteriensis.* This is particularly true of the basi-occipital region, the upper jaw, and the face-bones. We are thus enabled to supplement our knowledge of Mousterian craniometry at several points and to correct it at others. This is the first case, for example, in which the foramen magnum has been preserved in human crania of the Mousterian type. It is found to be elongated, and is situated farther back than in modern inferior races. The character of the inion and its relation to the cranial base is revealed for the first time. The same may be said of the palate, which is relatively long, the sides of the alveolar arch being nearly parallel; that is to say, the palate is hypsiloid — one of the two characteristic simian forms. Boule also notes the absence of the fossa canina. The nose, separated from the prominent glabella by a pronounced depression, is relatively short and broad. The lower jaw is remarkable for its size, for the antero-posterior extent of the condyles, the shallowness of the incisura mandibulæ, and the absence of chin.

The man of La Chapelle-aux-Saints is welcomed into the Mousterian family ranks, already represented by cousins from nearly a score of localities in various parts of Europe. To the abbés who have introduced him, the science of prehistoric archeology owes a special debt of thanks, as it does also to so many other members of the priesthood from the times of MacEnery and Bourgeois down to that of Breuil. As for *Homo Heidelbergensis* he stands in a class, ancestral, to be sure, but by himself. Let us hope that he too may not long lack companionship of his own kind.

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